PER6760A

Fanless Rugged system
User's Manual

Safety Information

1. Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area.
- If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your local distributor.

2. Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter any technical problems with the product, contact your local distributor

Statement

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- All product specifications are subject to change without prior notice

Revision History

Revision	Date (dd.mm.yyyy)	Changes
Version 1.0	4.1.2015	Initial release

Packing list

- ☐ PER6760A Fanless system
- ☐ SO-DIMM (**optional)**
- ☐ SATA HDD/SSD **(optional)**
- ☐ CD (Driver + user's manual)
- ☐ Terminal block 3 PIN x 1pcs
- ☐ CPU Process optional
  - **Processor:**
    a. Intel® Core™ i7-3610QE Processor (6M Cache, 2.30 GHz), 45 W
    b. Intel® Core™ i5-3610ME Processor (3M Cache, 2.70 GHz), 35W
    c. Intel® Core™ i3-3120ME Processor (3M Cache, 2.40 GHz), 35W

If any of the above items is damaged or missing, please contact your local distributor.

Ordering Information

Model Number	Description
PER6760A (SPER6760A0000000)	Intel® QM77 Fanless Rugged System with Intel® Ivy Bridge Core™ i7/i5/i3 Processor, AMD E6760 GPU DPx4, 8V to 26V DC-in, Extended Temp. -20 to 60°C

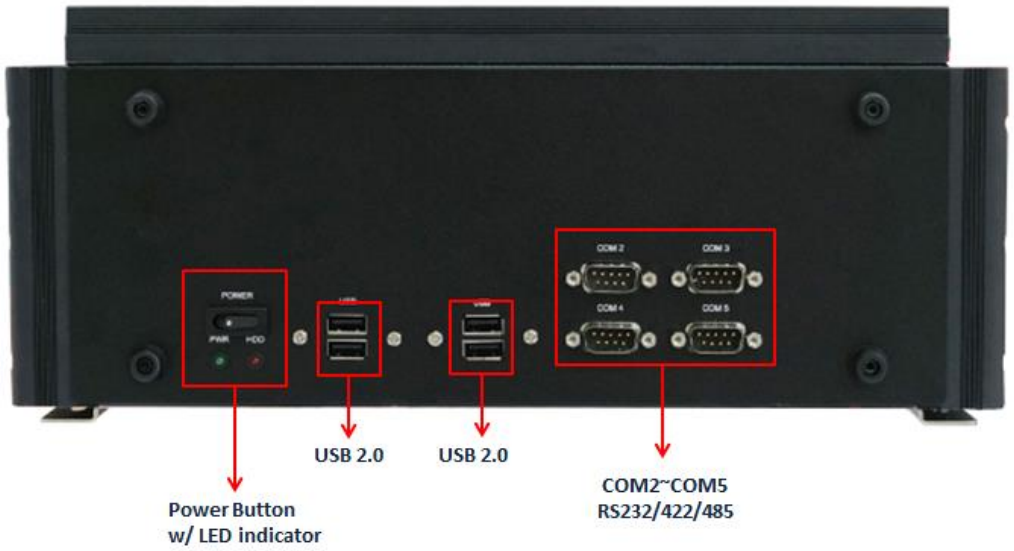
Table of Contents

Safety Information 2
1. Electrical safety 2
2. Operation safety 2
Statement 2
Revision History 3
Packing list 3
Ordering Information 3
Table of Contents 4
1.1 Front Panel Components 6
1.2 Back Panel Components 6
1.3 Mechanical Drawing 9
Power Input: DC-in +8V~+26V 10
USB Port: USB2.0 10
COM2~COM3: RS232 with +12V/+5V selection 10
COM4: RS232 10
COM5: RS232/422/485 11
VGA: VGA 11
DVI-D: DVI-D 11
COM1: RS232/422/485 with +12V/+5V selection 12
HDMI: HDMI 12
LAN1_USB12: USB3.0 port 0,1 and LAN connector 1 13
LAN2_USB34: USB3.0 port 3,4 and LAN connector 2 13
Audio Lack 13
Display Port 14
3.1 Starting 15
3.2 Navigation Keys 15
3.3 Main Menu 16
3.4 Advanced Menu 17
3.4.1 ACPI Settings 18
3.4.2 CPU Configuration 20
3.4.3 SATA Configuration 22
3.4.4 Thermal Configuration 23
3.4.5 Intel Rapid Start Technology 24
3.4.6 Intel TXT(LT) Configuration 24
3.4.7 PCH-FW Configuration 25
3.4.8 Intel Anti-Theft Technology Configuration 25

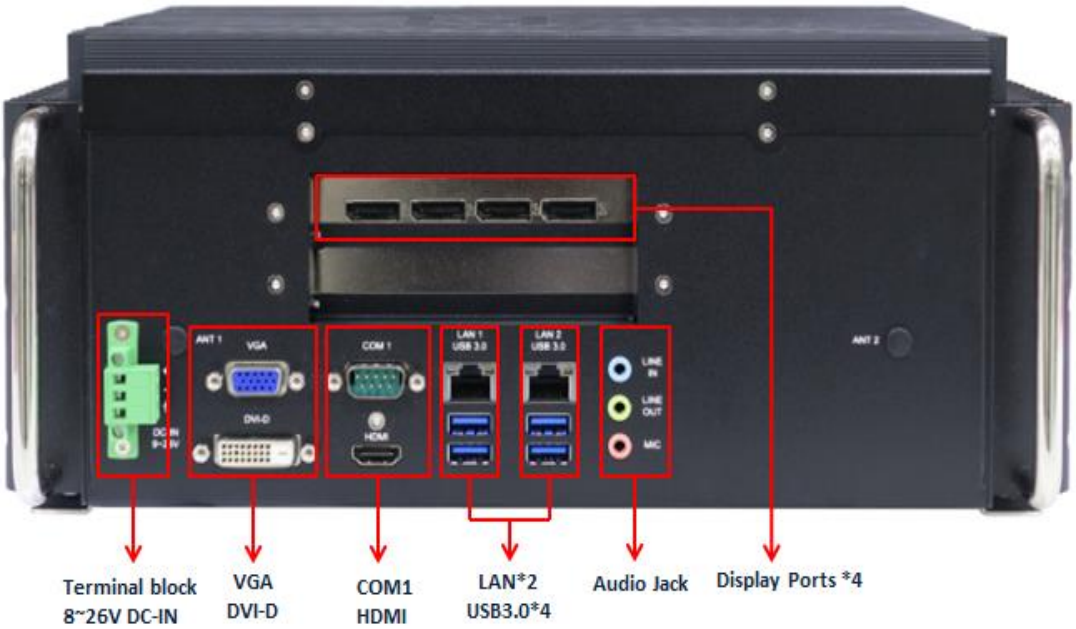
3.4.9 AMT Configuration 26
3.4.10 USB Configuration 28
3.4.11 F81866 Super IO Configuration 29
3.4.12 F81866 H/W Monitor 30
3.4.13 Serial Port Console Redirection 31
3.4.14 CPU PPM Configuration 32
3.5 Chipset 33
3.5.1 PCH-IO Configuration 33
3.5.2 System Agent (SA) Configuration 37
3.6 Boot Setting 40
3.7 Security 41
3.8 Save and exit 42

Chapter 1: Product Information

1.1 Front Panel Components



1.2 Back Panel Components



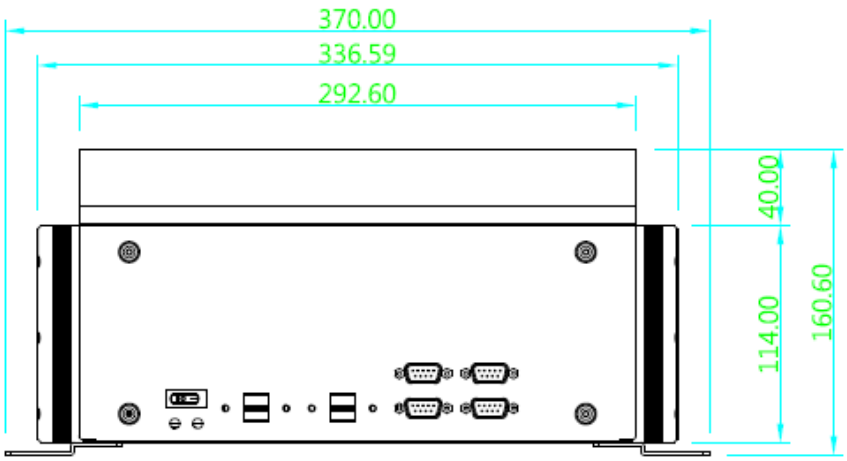
1.2 Key Features

Processor & System	
CPU Type	Intel® 22nm Ivy Bridge Processor (Mobile) socket (rPGA988) Core™ i7-3610QE 2.3 GHz (6M Cache, 45W) Core™ i5-3610ME 2.7 GHz (3M Cache, 35W) Core™ i3-3120ME 2.4 GHz (3M Cache, 35W)
Chipset	Intel® QM77
Memory Type	2 x 204-pin SO-DIMM support up to 16 GB dual channel DDR3 1333/1600, Non-ECC
Ethernet	Intel® 82579LM & 82574IT GbE LAN (support 10/100/1000Mbps for x2 RJ45 ports)
Storage Device	2 x 2.5" SATA HDD/SSD
Display	
Chipset	Integrated GFX in Ivy Bridge processor
Onboard VGA	Yes, (Max: SXGA 2048 x1536) @ 60 Hz
Onboard DVI-D	Yes, (Max. resolution 1920 x 1200)
Onboard HDMI	Yes, (Max. resolution 1920 x 1200)
Display Ports	Yes, (Max. resolution 2560 x 1600)
Independent Display Capability	VGA, DVI, HDMI, Display port
Audio	
Codec	Realtek ALC892 High Definition Audio Codec

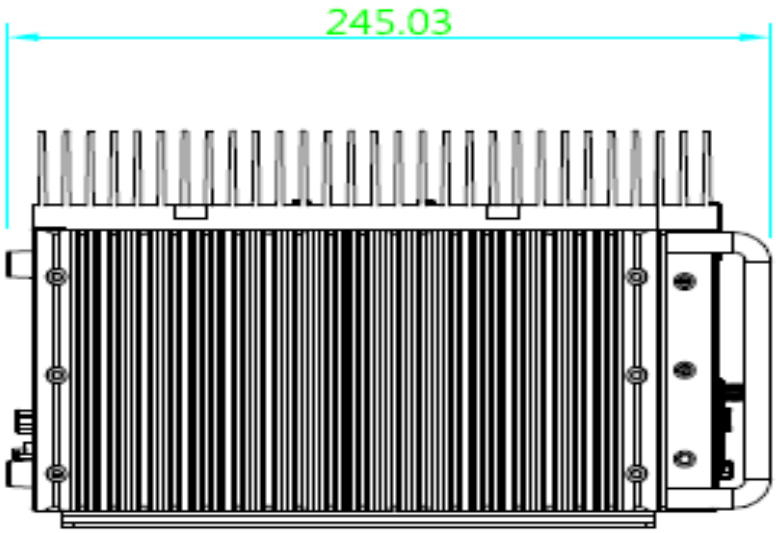
Front Panel I/O	
Power button w/ LED indicator	1
USB 2.0	4
COM2~5	2 x RS232/with 5V/12V by jumper selectable 1 x RS232 1 x RS232/422/485
Back Panel I/O	
Power IN	1 (3 pins terminal block)
VGA	1
DVI-D	1
COM1	1 (COM port, RS232/422/485 with 5V/12V by jumper selectable)
HDMI	1
LAN	2
USB3.0	4
Audio Jack	1 (Line-in, Line-out, MIC)
Display port	4
Mechanical and Environment	
Power Type	8V to 26V DC-in
Dimension	370 x 160.6 x 245.03 mm
Storage Temp.	-20 to 80°C
Operating Temp.	-20 to 60°C
Relative Humidity	10% to 90%, non-condensing

*All specifications and photos are subject to change without notice.

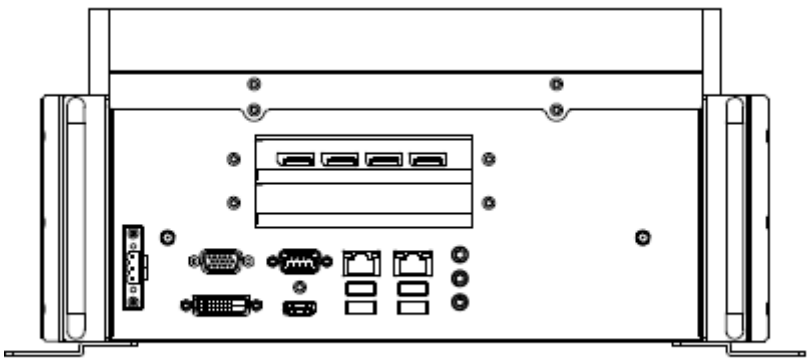
1.3 Mechanical Drawing



Front



Right

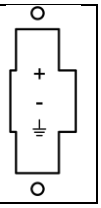


Back

Chapter 2: Connectors definition

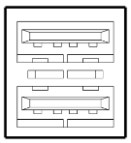
Power Input: DC-in +8V~+26V

PIN	DEFINITION
1	+8V~+26V
2	-
3	GND



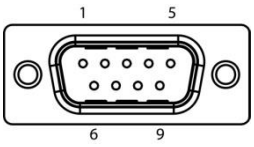
USB Port: USB2.0

PIN	DEFINITION	PIN	DEFINITION
1	+5V	5	+5V
2	USBD-	6	USBD-
3	USBD+	7	USBD+
4	GND	8	GND



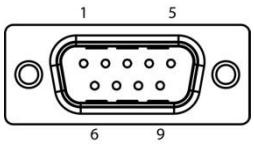
COM2~COM3: RS232 with +12V/+5V selection

PIN	DEFINITION	PIN	DEFINITION
1	DCD-	2	RXD
3	TXD	4	DTR-
5	GND	6	DSR-
7	RTS-	8	CTS-
9	COM2P9SEL/ COM3P9SEL (Define by JP6/7)		



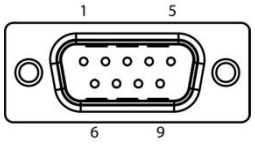
COM4: RS232

PIN	DEFINITION	PIN	DEFINITION
1	DCD-	2	RXD
3	TXD	4	DTR-
5	GND	6	DSR-
7	RTS-	8	CTS-
9	RI-		



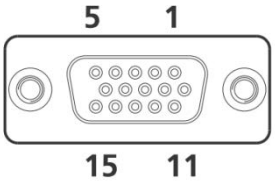
COM5: RS232/422/485

PIN	RS-232	RS-422	HALF DUPLEX RS-485
1	DCD-	TX-	DATA-
2	RXD	RX+	NA
3	TXD	TX+	DATA+
4	DTR-	RX-	NA
5	GND	GND	GND
6	DSR-	NA	NA
7	RTS-	NA	NA
8	CTS-	NA	NA
9	RI-	RI-	RI-



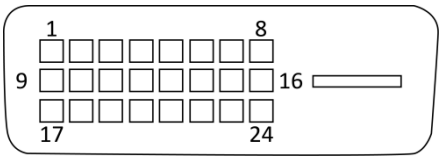
VGA: VGA

PIN	DEFINITION	PIN	DEFINITION
1	RED	9	+5V
2	GREEN	10	GND
3	BLUE	11	NC
4	NC	12	DDC DATA
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	DDC CLOCK
8	GND		



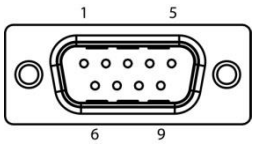
DVI-D: DVI-D

PIN	DEFINITION	PIN	DEFINITION
1	TMDS2-	13	NC
2	TMDS2+	14	+5V
3	GND	15	GND
4	NC	16	HOTPLUG_DETECT
5	NC	17	TMDS0-
6	DDC_CLK	18	TMDS0+
7	DDC_DATA	19	GND
8	NC	20	NC
9	TMDS1-	21	NC
10	TMDS1+	22	GND
11	GND	23	TMDSCLK+
12	NC	24	TMDSCLK-



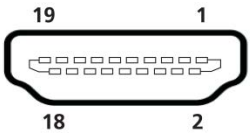
COM1: RS232/422/485 with +12V/+5V selection

PIN	RS-232	RS-422	HALF DUPLEX RS-485
1	DCD-	TX-	DATA-
2	RXD	RX+	NA
3	TXD	TX+	DATA+
4	DTR-	RX-	NA
5	GND	GND	GND
6	DSR-	NA	NA
7	RTS-	NA	NA
8	CTS-	NA	NA
9	COM1P9SEL (Define by JP5)	COM1P9SEL (Define by JP5)	COM1P9SEL (Define by JP5)



HDMI: HDMI

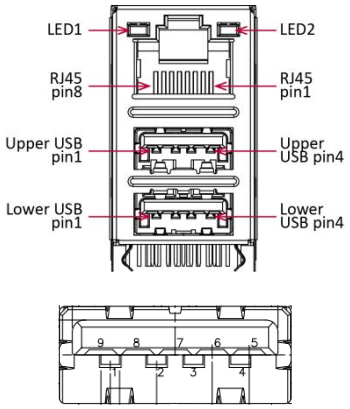
PIN	DEFINITION	PIN	DEFINITION
1	HDMI_2P	11	GND
2	GND	12	HDMI_CLKN
3	HDMI_2N	13	NC
4	HDMI_1P	14	NC
5	GND	15	DDC CLOCK
6	HDMI_1N	16	DDC DATA
7	HDMI_0P	17	GND
8	GND	18	+5V
9	HDMI_0N	19	HOTPLUG_DETECT
10	HDMI_CLKP		



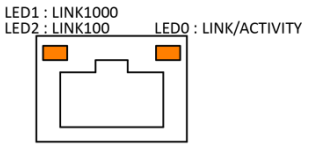
LAN1_USB12: USB3.0 port 0,1 and LAN connector 1

LAN2_USB34: USB3.0 port 3,4 and LAN connector 2

UPPER USB		LOWER USB		LAN	
PIN	DEFINITION	PIN	DEFINITION	PIN	DEFINITION
1	+5VDUAL	1	+5VDUAL	1	D0+
2	D-	2	D-	2	D0-
3	D+	3	D+	3	D1+
4	GND	4	GND	4	D1-
5	StdA_SSTX-	5	StdA_SSTX-	5	D2+
6	StdA_SSTX+	6	StdA_SSTX+	6	D2-
7	GND_DRIAN	7	GND_DRIAN	7	D3+
8	StdA_SSRX-	8	StdA_SSRX-	8	D3-
9	StdA_SSRX-	9	StdA_SSRX-		

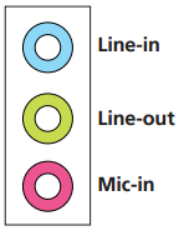


SPEED LED: (LIFT)	ACTIVE LED: (RIGHT)
GREEN: 1000Mbps	ORANGE (BLINKING): ACTIVITY
ORANGE: 100Mbps	No Light: NOT LINK
No Light: 10Mbps	ORANGE (NO BLINKING): LINK



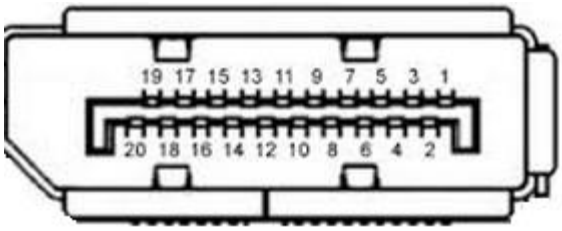
Audio Lack

Pin	Definition
A1	LINE-IN_L
A2	LINE-IN_JD
A3	AGND
A4	LINE-IN_R
B1	LINE-OUT_L
B2	LINE-OUT _JD
B3	AGND
B4	LINE-OUT _R
C1	MIC_L
C2	MIC_JD
C3	AGND
C4	MIC_R
C0	AGND



Display Port

Pin	Definition
1	ML_Lane 0(p)
2	GND
3	ML_Lane 0(n)
4	ML_Lane 1(p)
5	GND
6	ML_Lane 1(n)
7	ML_Lane 2(p)
8	GND
9	ML_Lane 2(n)
10	ML_Lane 3(p)
11	GND
12	ML_Lane 3(n)
13	GND
14	GND
15	AUX_CH(p)
16	GND
17	AUX_CH(n)
18	Hot Plug
19	DP_PWR Return
20	DP_PWR



Chapter 3: AMI BIOS UTILITY

This chapter provides users with detailed descriptions on how to set up a basic system configuration through the AMI BIOS setup utility.

3.1 Starting

To enter the setup screens, perform the following steps:

- Turn on the computer and press the <Del> key immediately.
- After the <Del> key is pressed, the main BIOS setup menu displays. Other setup screens can be accessed from the main BIOS setup menu, such as the Chipset and Power menus.

3.2 Navigation Keys

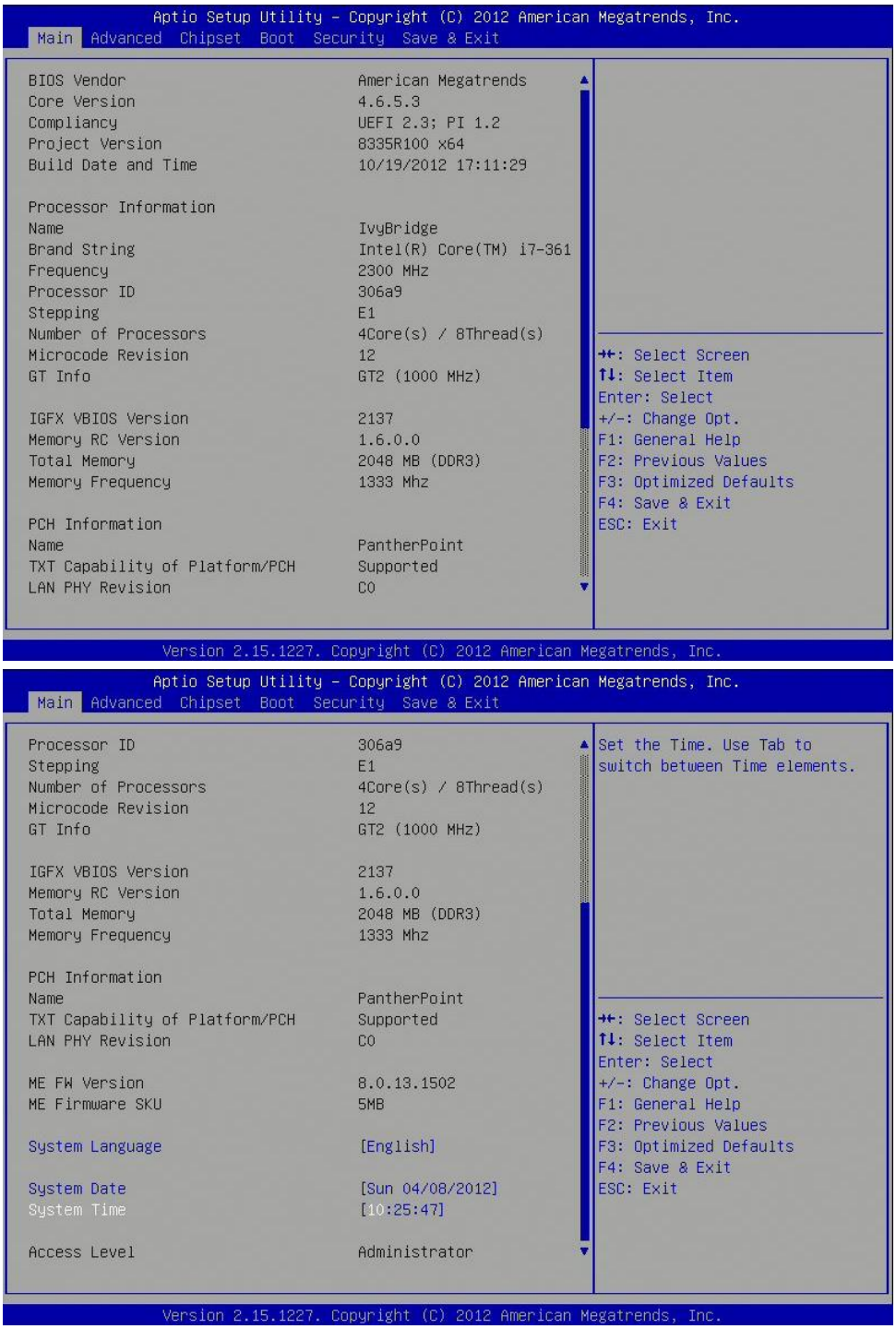
The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process.
Some of the hot keys are <F1>, <F10>, <Enter>, <ESC>, and <Arrow> keys.

Some of the navigation keys may differ from one screen to another.

Left/Right	The Left and Right <Arrow> keys moves the cursor to select a menu.
Up/Down	The Up and Down <Arrow> keys moves the cursor to select a setup screen or sub-screen.
+– Plus/Minus	The Plus and Minus <Arrow> keys changes the field value of a particular setup setting.
Tab	The <Tab> key selects the setup fields.
F1	The <F1> key displays the General Help screen.
F10	The <F10> key saves any changes made and exits the BIOS setup utility.
Esc	The <Esc> key discards any changes made and exits the BIOS setup utility.
Enter	The <Enter> key displays a sub-screen or changes a selected or highlighted option in each menu.

3.3 Main Menu

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
BIOS Vendor American Megatrends
Core Version 4.6.5.3
Compliancy UEFI 2.3; PI 1.2
Project Version 8335R100 x64
Build Date and Time 10/19/2012 17:11:29
Processor Information
Name IvyBridge
Brand String Intel(R) Core(TM) i7-361
Frequency 2300 MHz
Processor ID 306a9
Stepping E1
Number of Processors 4Core(s) / 8Thread(s)
Microcode Revision 12
GT Info GT2 (1000 MHz)
IGFX VBIOS Version 2137
Memory RC Version 1.6.0.0
Total Memory 2048 MB (DDR3)
Memory Frequency 1333 Mhz
PCH Information
Name PantherPoint
TXT Capability of Platform/PCH Supported
LAN PHY Revision C0
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.
Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Processor ID 306a9
Stepping E1
Number of Processors 4Core(s) / 8Thread(s)
Microcode Revision 12
GT Info GT2 (1000 MHz)
IGFX VBIOS Version 2137
Memory RC Version 1.6.0.0
Total Memory 2048 MB (DDR3)
Memory Frequency 1333 Mhz
PCH Information
Name PantherPoint
TXT Capability of Platform/PCH Supported
LAN PHY Revision C0
ME FW Version 8.0.13.1502
ME Firmware SKU 5MB
System Language [English]
System Date [Sun 04/08/2012]
System Time [10:25:47]
Access Level Administrator
Set the Time. Use Tab to switch between Time elements.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.

System Language

Use this function to select the system language.

System Date

Use this function to change the system date.

Select System Date using the Up and Down <Arrow> keys. Enter the new values through the keyboard.

Press the Left and Right <Arrow> keys to move between fields.

The date setting must be entered in MM/DD/YY format.

System Time

Use this function to change the system time.

Select System Time using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Press the Left and Right <Arrow> keys to move between fields.

The time setting is entered in HH:MM:SS format.

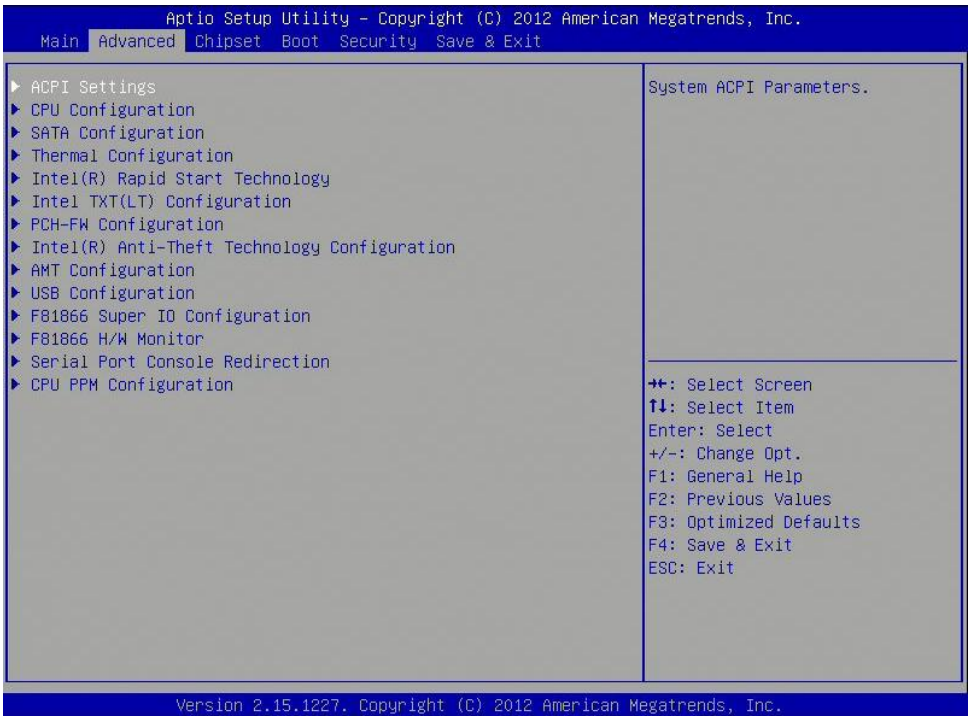
Note: The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

Access Level

Displays the access level of the current user in the BIOS.

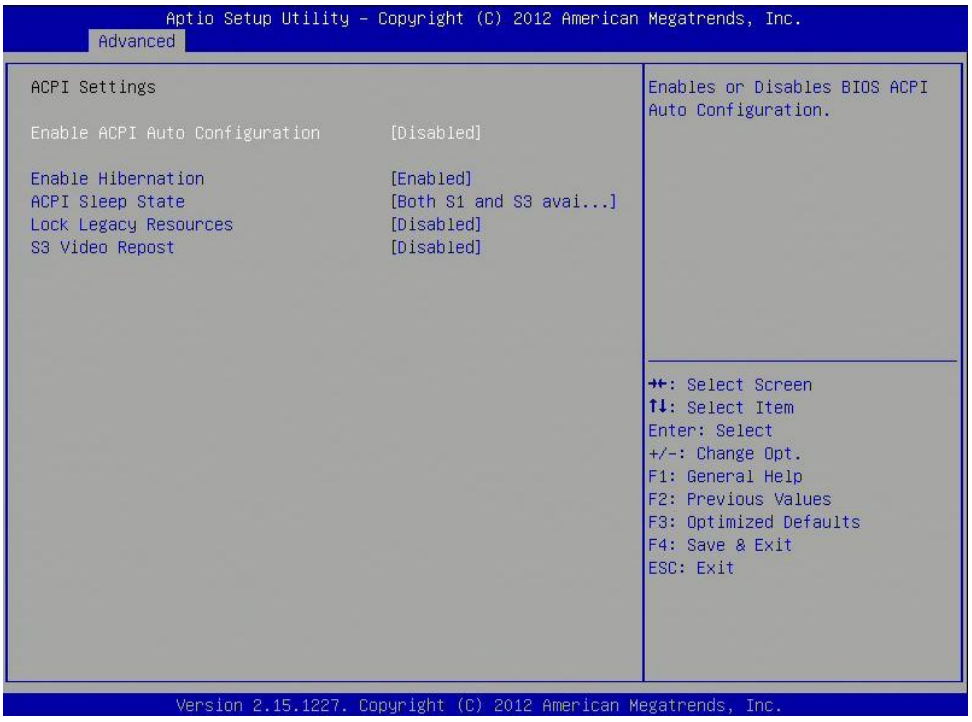
3.4 Advanced Menu

The Advanced Menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference. ***Setting incorrect field values may cause the system to malfunction.***



3.4.1 ACPI Settings

System ACPI parameters


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
ACPI Settings
Enable ACPI Auto Configuration [Disabled]
Enable Hibernation [Enabled]
ACPI Sleep State [Both S1 and S3 avai...]
Lock Legacy Resources [Disabled]
S3 Video Repost [Disabled]
Enables or Disables BIOS ACPI Auto Configuration.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.

Enable ACPI Auto Configuration

Enables or disables BIOS ACPI auto configuration.

Enable Hibernation

Enables or disables system ability to hibernate (OS/S4 Sleep State). This option may not be effective with some OS.

ACPI Sleep State

Select the ACPI sleep state the system will enter when the suspend button is pressed.

Lock Legacy Resources

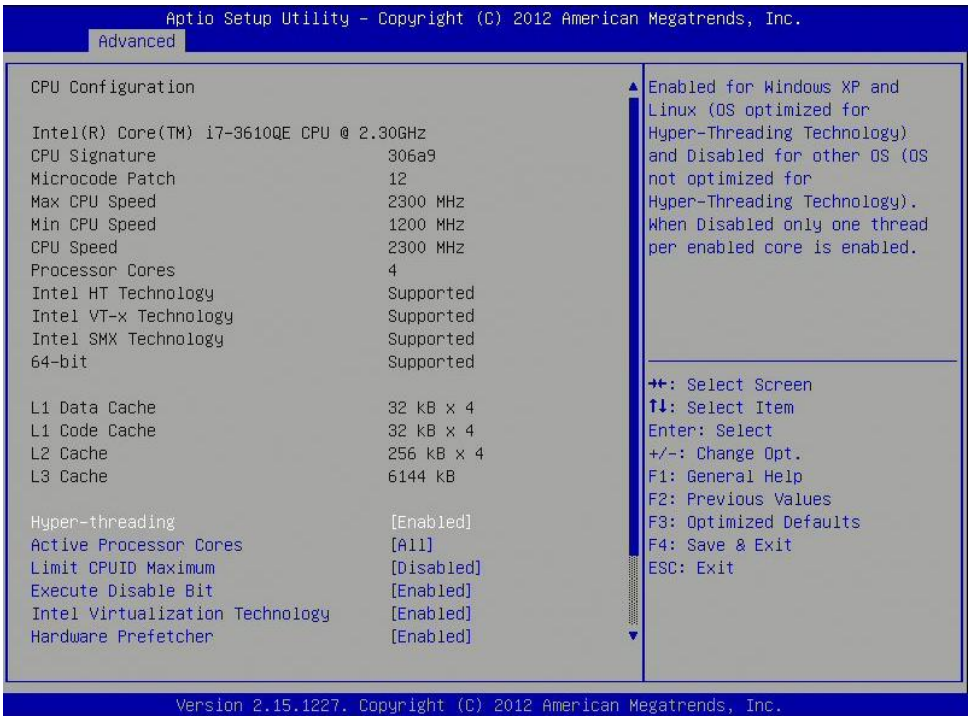
Enables or Disables System Lock of Legacy Resources.

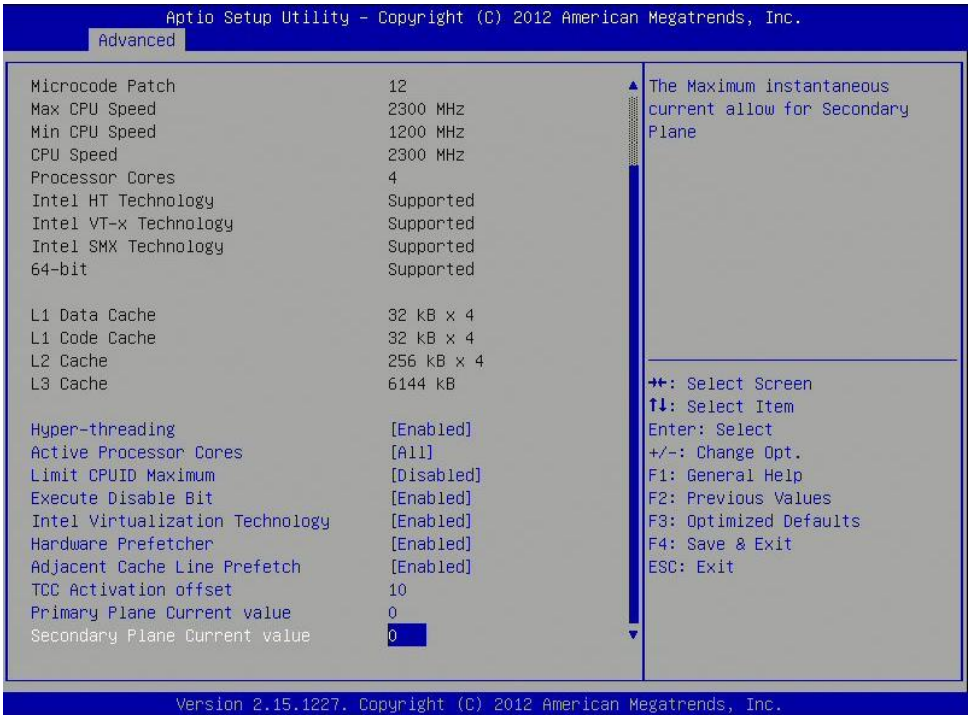
S3 Video Repost

Enable or disable S3 Video Repost.

3.4.2 CPU Configuration

This section is used to configure the CPU.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
CPU Configuration
Intel(R) Core(TM) i7-3610QE CPU @ 2.30GHz
CPU Signature 306a9
Microcode Patch 12
Max CPU Speed 2300 MHz
Min CPU Speed 1200 MHz
CPU Speed 2300 MHz
Processor Cores 4
Intel HT Technology Supported
Intel VT-x Technology Supported
Intel SMX Technology Supported
64-bit Supported
L1 Data Cache 32 kB x 4
L1 Code Cache 32 kB x 4
L2 Cache 256 kB x 4
L3 Cache 6144 kB
Hyper-threading [Enabled]
Active Processor Cores [All]
Limit CPUID Maximum [Disabled]
Execute Disable Bit [Enabled]
Intel Virtualization Technology [Enabled]
Hardware Prefetcher [Enabled]
Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Microcode Patch 12
Max CPU Speed 2300 MHz
Min CPU Speed 1200 MHz
CPU Speed 2300 MHz
Processor Cores 4
Intel HT Technology Supported
Intel VT-x Technology Supported
Intel SMX Technology Supported
64-bit Supported
L1 Data Cache 32 kB x 4
L1 Code Cache 32 kB x 4
L2 Cache 256 kB x 4
L3 Cache 6144 kB
Hyper-threading [Enabled]
Active Processor Cores [All]
Limit CPUID Maximum [Disabled]
Execute Disable Bit [Enabled]
Intel Virtualization Technology [Enabled]
Hardware Prefetcher [Enabled]
Adjacent Cache Line Prefetch [Enabled]
TCC Activation offset 10
Primary Plane Current value 0
Secondary Plane Current value 0
The Maximum instantaneous current allow for Secondary Plane
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.

Hyper-threading

Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When disabled only one thread per enabled core is enabled.

Active Processor Cores

Number of cores to enable in each processor package.

Limit CPUID Maximum

Disabled for Windows XP.

Execute Disable Bit

XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Sever 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 Update 3.)

Intel Virtualization Technology

When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Hardware Prefetcher

To turn on/off the Mid Level Cache (L2) streamer prefectcher

Adjacent Cache Line Prefetche

To turn on/off prefectching of adjacent cache lines

TCC Activation Offset

Offset from the factory TCC activation temperature

Primary Plane Current Value

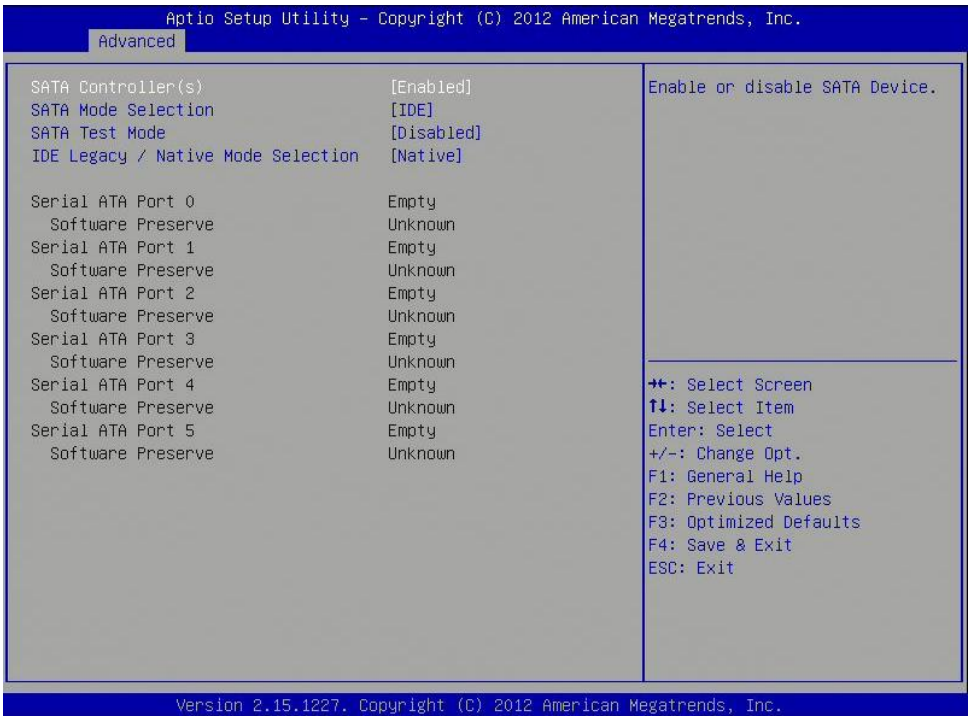
The Maximum instantaneous current allow for primary plane

Secondary Plane Current Value

The Maximum instantaneous current allow for secondary plane

3.4.3 SATA Configuration

This section is used to configure the SATA drives.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
SATA Controller(s) [Enabled]
SATA Mode Selection [IDE]
SATA Test Mode [Disabled]
IDE Legacy / Native Mode Selection [Native]
Serial ATA Port 0 Empty
Software Preserve Unknown
Serial ATA Port 1 Empty
Software Preserve Unknown
Serial ATA Port 2 Empty
Software Preserve Unknown
Serial ATA Port 3 Empty
Software Preserve Unknown
Serial ATA Port 4 Empty
Software Preserve Unknown
Serial ATA Port 5 Empty
Software Preserve Unknown
Enable or disable SATA Device.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.

SATA Controller(s)

Enable or disable SATA device.

SATA Mode Selection

Determines how SATA controller(s) operate.

SATA Test Selection

Enable or disable Test Mode

IDE Legacy/Native Mode Selection

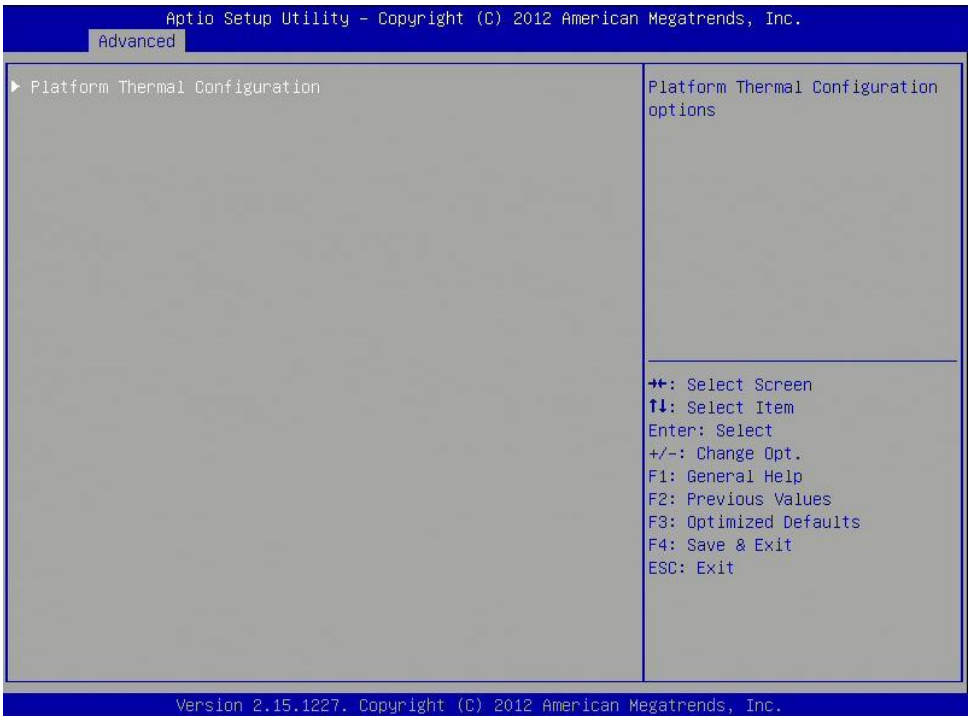
IDE Legacy/Native Mode Selection

Serial ATA Port 0 – 5

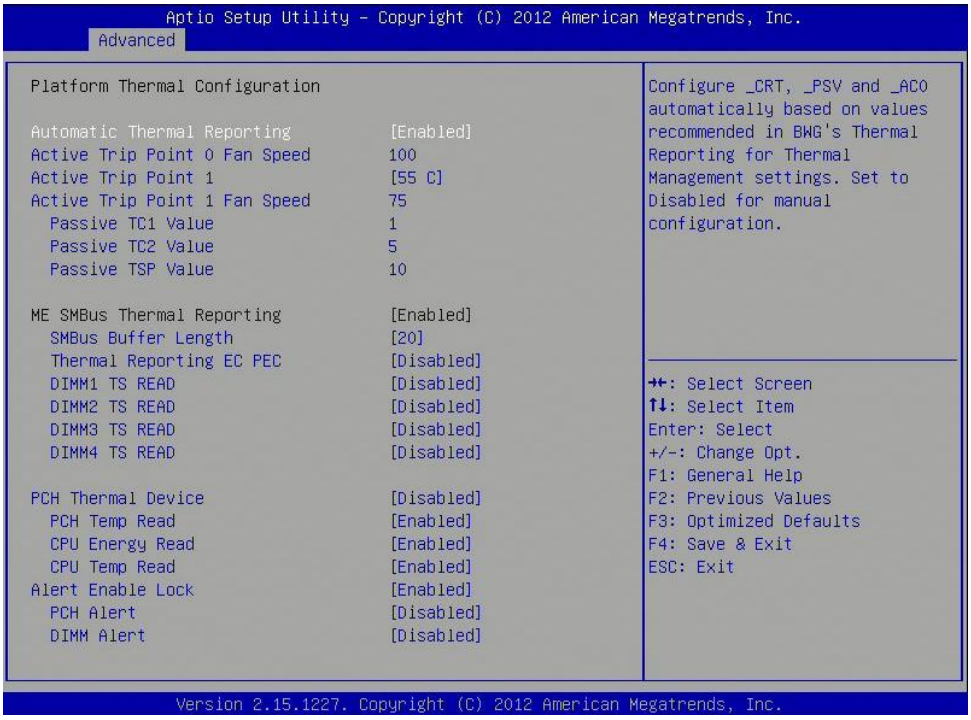
Displays information on the SATA devices detected

3.4.4 Thermal Configuration

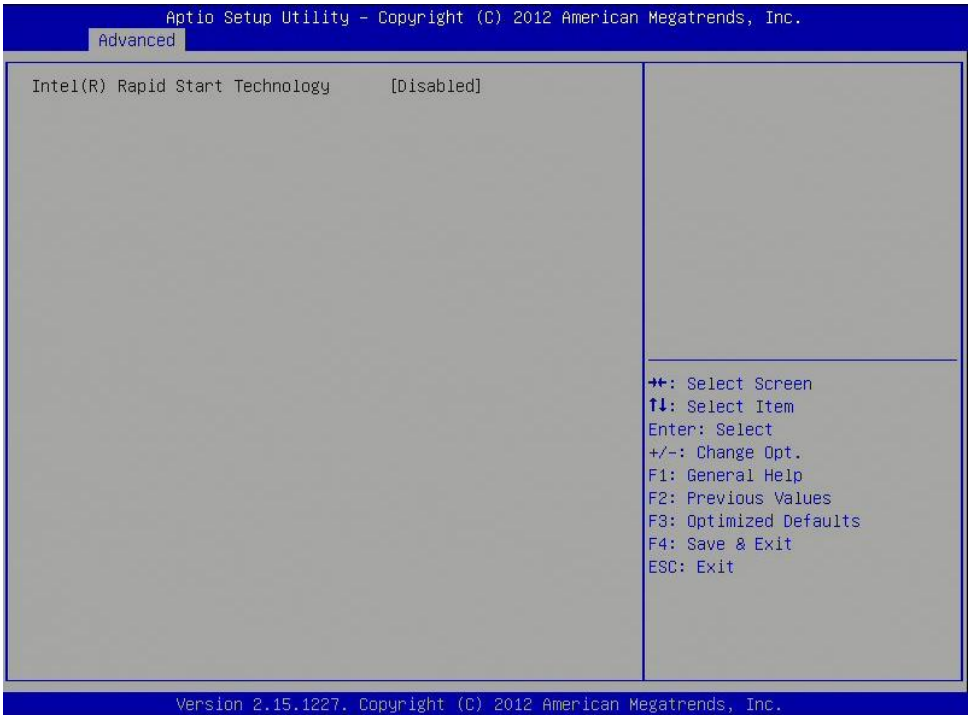
Platform thermal configuration options



3.4.4.1 Platform thermal configuration

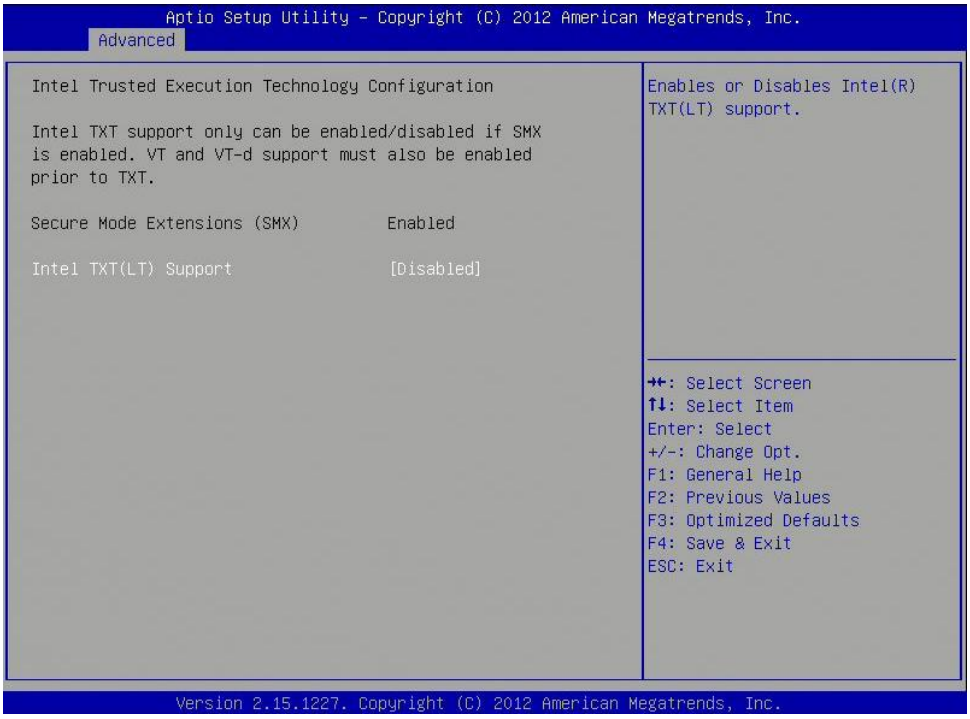

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Platform Thermal Configuration
Automatic Thermal Reporting [Enabled]
Active Trip Point 0 Fan Speed 100
Active Trip Point 1 [55 C]
Active Trip Point 1 Fan Speed 75
Passive TC1 Value 1
Passive TC2 Value 5
Passive TSP Value 10
ME SMBus Thermal Reporting [Enabled]
SMBus Buffer Length [20]
Thermal Reporting EC PEC [Disabled]
DIMM1 TS READ [Disabled]
DIMM2 TS READ [Disabled]
DIMM3 TS READ [Disabled]
DIMM4 TS READ [Disabled]
PCH Thermal Device [Disabled]
PCH Temp Read [Enabled]
CPU Energy Read [Enabled]
CPU Temp Read [Enabled]
Alert Enable Lock [Enabled]
PCH Alert [Disabled]
DIMM Alert [Disabled]
Configure _CRT, _PSV and _ACO automatically based on values recommended in BWG's Thermal Reporting for Thermal Management settings. Set to Disabled for manual configuration.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.

3.4.5 Intel Rapid Start Technology



3.4.6 Intel TXT(LT) Configuration

Intel Trusted Execution Technology

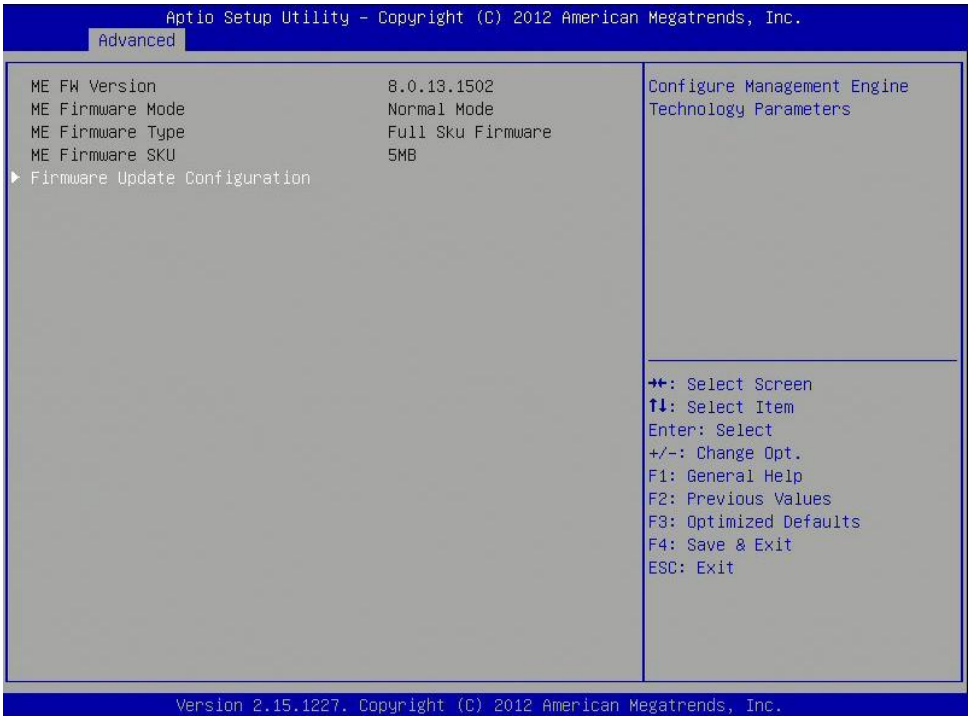

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Intel Trusted Execution Technology Configuration
Intel TXT support only can be enabled/disabled if SMX is enabled. VT and VT-d support must also be enabled prior to TXT.
Secure Mode Extensions (SMX) Enabled
Intel TXT(LT) Support [Disabled]
Enables or Disables Intel(R) TXT(LT) support.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.

Intel TXT(LT) Support

Enables or disables Intel TXT(LT) support

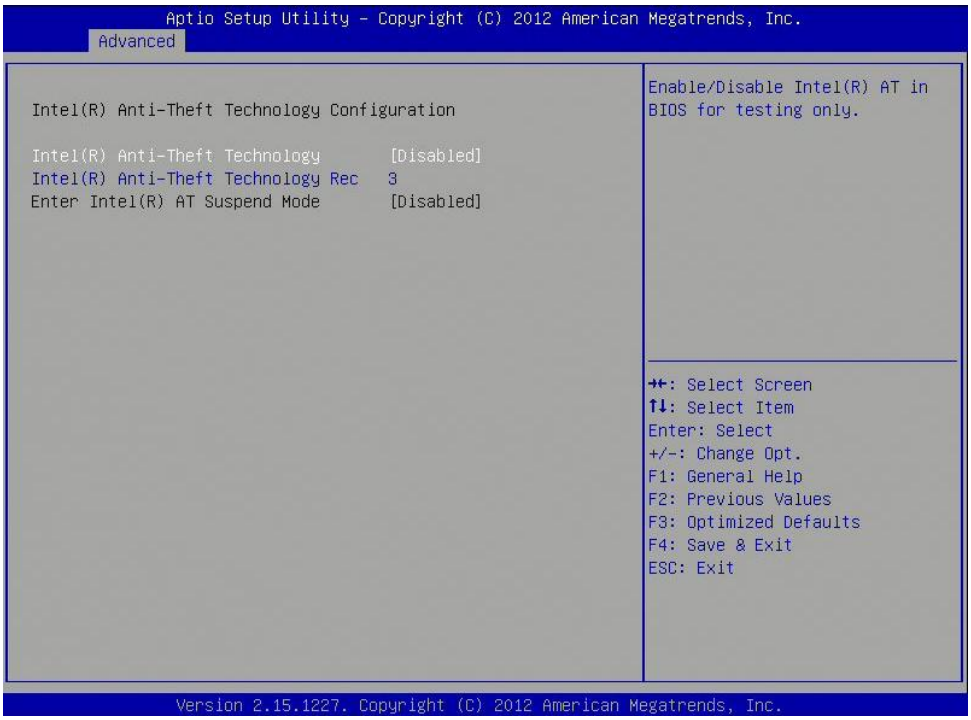
3.4.7 PCH-FW Configuration

This section is used to configure Management Engine Technology parameters.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
ME FW Version 8.0.13.1502
ME Firmware Mode Normal Mode
ME Firmware Type Full Sku Firmware
ME Firmware SKU 5MB
Firmware Update Configuration
Configure Management Engine Technology Parameters
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.

3.4.8 Intel Anti-Theft Technology Configuration

Disabling Intel AT allow user to login platform. This is strictly for testing only. This does not disable Intel AT services in ME


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Intel(R) Anti-Theft Technology Configuration
Intel(R) Anti-Theft Technology [Disabled]
Intel(R) Anti-Theft Technology Rec 3
Enter Intel(R) AT Suspend Mode [Disabled]
Enable/Disable Intel(R) AT in BIOS for testing only.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.

Intel Anti-Theft Technology

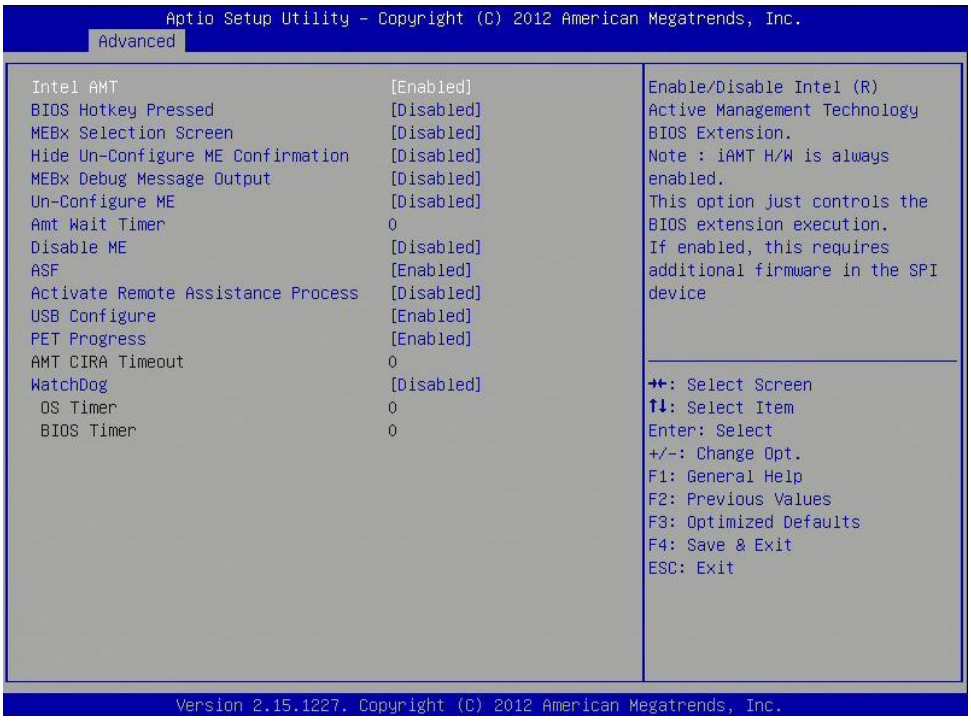
Enable or Disable Intel AT in BIOS for testing only

Intel Anti-Theft Technology Rec

Set the number of times Recovery attemped will be allowed.

3.4.9 AMT Configuration

This section is used to configure Active Management Technology (AMT) options.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Intel AMT [Enabled]
BIOS Hotkey Pressed [Disabled]
MEBx Selection Screen [Disabled]
Hide Un-Configure ME Confirmation [Disabled]
MEBx Debug Message Output [Disabled]
Un-Configure ME [Disabled]
Amt Wait Timer 0
Disable ME [Disabled]
ASF [Enabled]
Activate Remote Assistance Process [Disabled]
USB Configure [Enabled]
PET Progress [Enabled]
AMT CIRA Timeout 0
WatchDog [Disabled]
OS Timer 0
BIOS Timer 0
Enable/Disable Intel (R) Active Management Technology BIOS Extension.
Note : iAMT H/W is always enabled.
This option just controls the BIOS extension execution.
If enabled, this requires additional firmware in the SPI device
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.

Intel AMT

Enable/disables Intel Active Management Technology BIOS extension.

Note: iAMT H/W is always enabled.

This option just controls the BIOS extension execution. If enabled, this requires additional firmware in the SPI device.

BIOS Hotkey Pressed

Enable/disable BIOS hotkey press.

MEBx Selection Screen

Enable/disable MEBx Selection Screen

Hide Un-Configure ME Confirmation

Hide Un-Configure ME without password confirmation prompt

MEBx Debug Message Screen

Enable MEBx debug message output

Un-Configure ME

Perform AMT/ME unconfigure without password operation.

Amt Wait Timer

Set timer to wait before sending ASF_GET_BOOT_OPTIONS.

Disable ME

Set ME to Soft Temporary Disabled

ASF

Enable/Disable Alert specification Format

Activate Remote Assistance Process

Trigger CIRA boot.

USB Confirgure

Enable/Disable USB configure function.

PET Progress

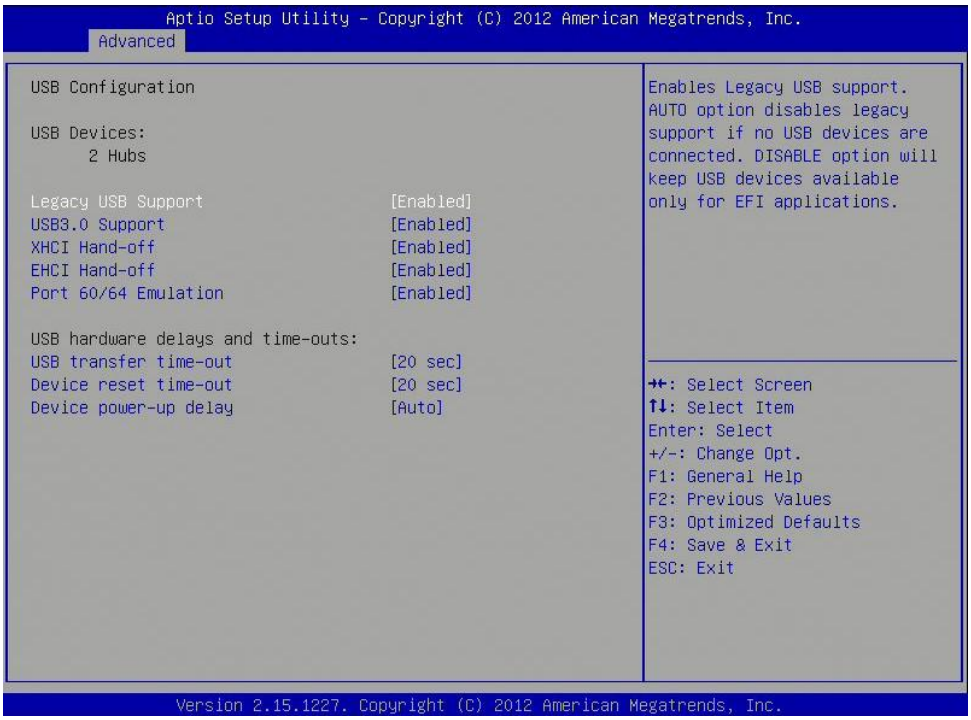
User can Enable/Disable PET Events progress to receive PET events or not.

Watchdog Timer

Enable/Disable Watchdog Timer.

3.4.10 USB Configuration

This section is used to configure the USB


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
USB Configuration
USB Devices:
2 Hubs
Legacy USB Support [Enabled]
USB3.0 Support [Enabled]
XHCI Hand-off [Enabled]
EHCI Hand-off [Enabled]
Port 60/64 Emulation [Enabled]
USB hardware delays and time-outs:
USB transfer time-out [20 sec]
Device reset time-out [20 sec]
Device power-up delay [Auto]
Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.

Legacy USB Support

Enables Legacy USB support.

AUTO option disables legacy support if no USB devices are connected.

DISABLE option will keep USB devices available only for EFI applications.

USB3.0 Support

Enable/Disable USB3.0 (XHCI) Controller support.

XHCI Hand-off

This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

EHCI Hand-off

This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.

Port 64/60 Emulation

Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.

USB Transfer time-out

The time-out value for Control, Bulk, and Interrupt transfers.

Device reset time-out

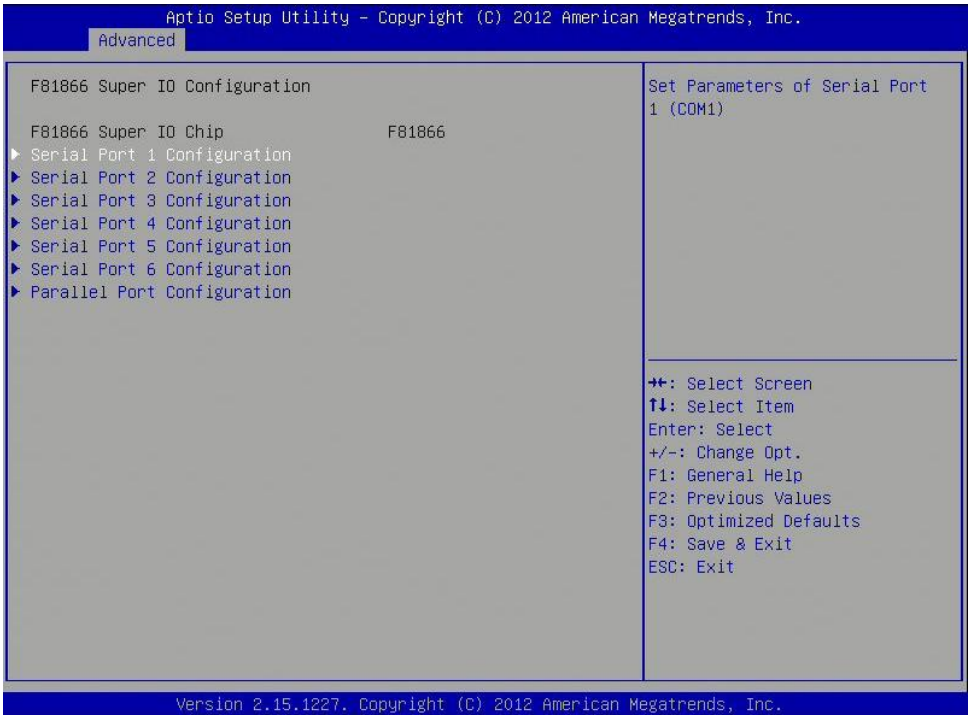
USB mass Storage device start Unit command time-out.

Device power-up delay

Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.

3.4.11 F81866 Super IO Configuration

System super IO chip parameters


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
F81866 Super IO Configuration
F81866 Super IO Chip F81866
Serial Port 1 Configuration
Serial Port 2 Configuration
Serial Port 3 Configuration
Serial Port 4 Configuration
Serial Port 5 Configuration
Serial Port 6 Configuration
Parallel Port Configuration
Set Parameters of Serial Port 1 (COM1)
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.

Serial Port Configuration

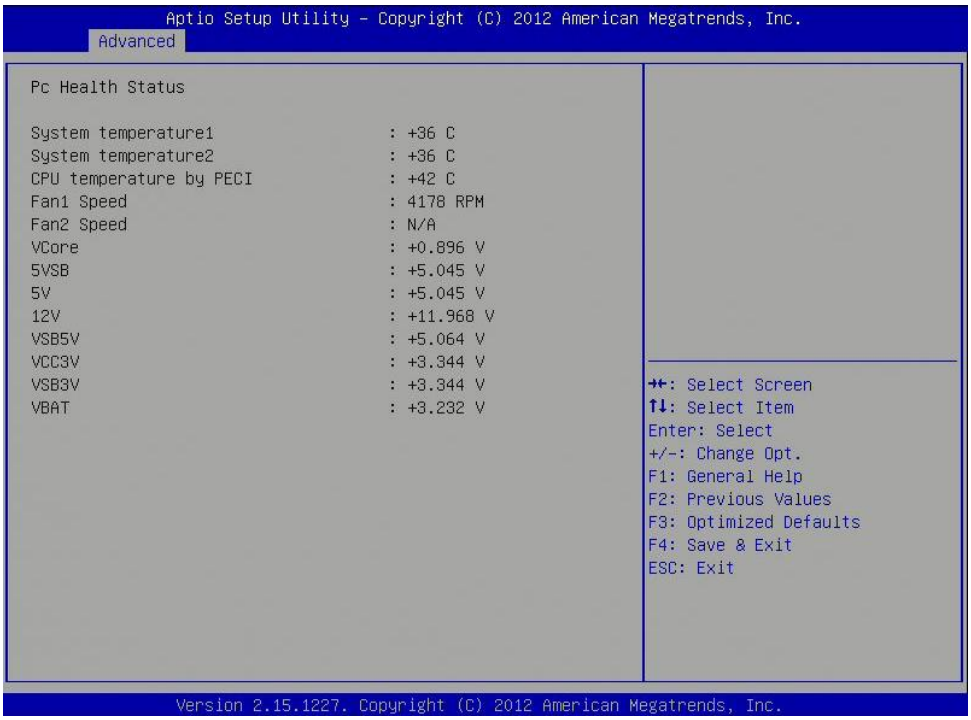
Set Parameters of Serial Ports. User can Enable/Disable the serial port and Select an optimal settings for the Super IO Device.

Parallel Port configuration

Set parameters of parallel port (LPT/LPTE)

3.4.12 F81866 H/W Monitor

This section is used to monitor hardware status such as temperature, fan speed and voltages.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Pc Health Status
System temperature1 : +36 C
System temperature2 : +36 C
CPU temperature by PECI : +42 C
Fan1 Speed : 4178 RPM
Fan2 Speed : N/A
VCore : +0.896 V
5VSB : +5.045 V
5V : +5.045 V
12V : +11.968 V
VSB5V : +5.064 V
VCC3V : +3.344 V
VSB3V : +3.344 V
VBAT : +3.232 V
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.

System Temperature

Detects and displays the current system temperature.

CPU Temperature

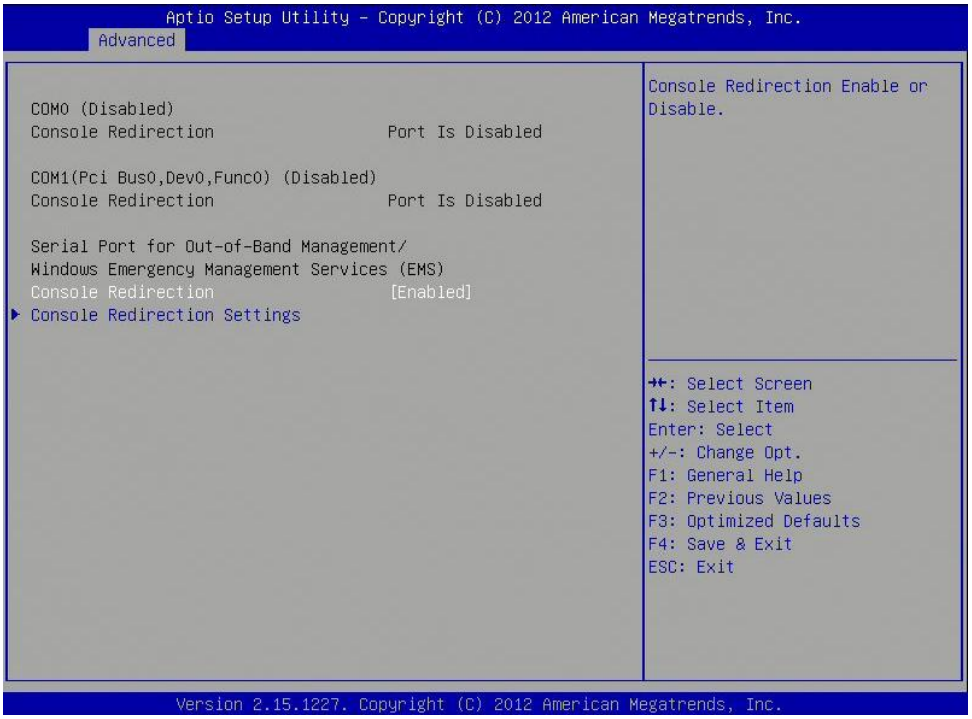
Detects and displays the current CPU temperature.

Fan1/2 Speed

Detects and displays the current CPU fan speed.

3.4.13 Serial Port Console Redirection

This screen provides information about functions for specifying the Serial Port Console Redirection configuration settings. Console redirection can be used to remotely operate system settings and the EFI console.



Console Redirection

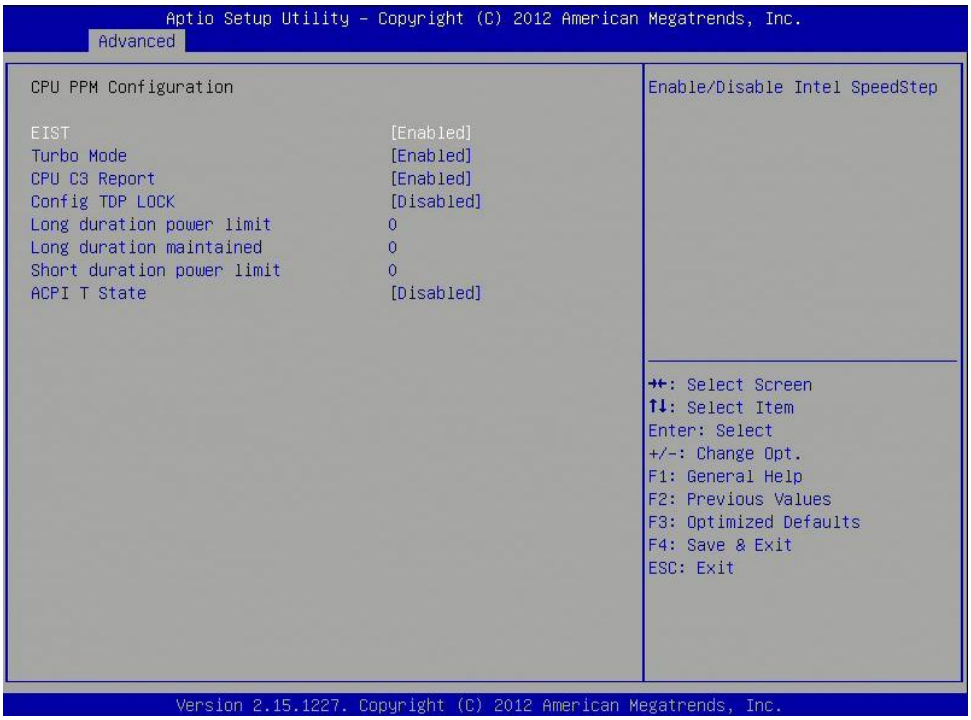
Console Redirection Enable or Disable.

Console Redirection Settings

The setting specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

3.4.14 CPU PPM Configuration

CPU PPM configuration parameters



EIST

Enables or disables Intel SpeedStep.

CPU C3 Report

Enable or disable CPU C3 (ACPI C2) report to OS.

Config TDP LOCK

Lock the Config TDP control register

Long duration power limit

Long duration power limit in Watts, 0 means use factory default.

Long duration maintained

Time window which the long duration power is maintained.

Short duration power limit

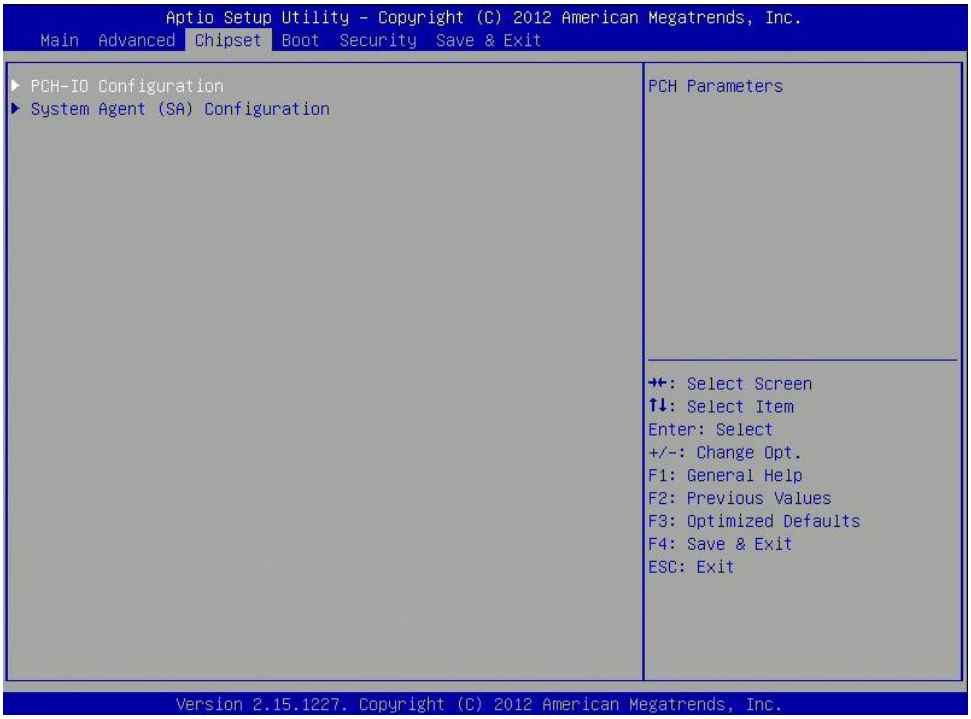
Short duration power limit in Watts, 0 means use factory default.

ACPI T State

Enable or disable ACPI state support.

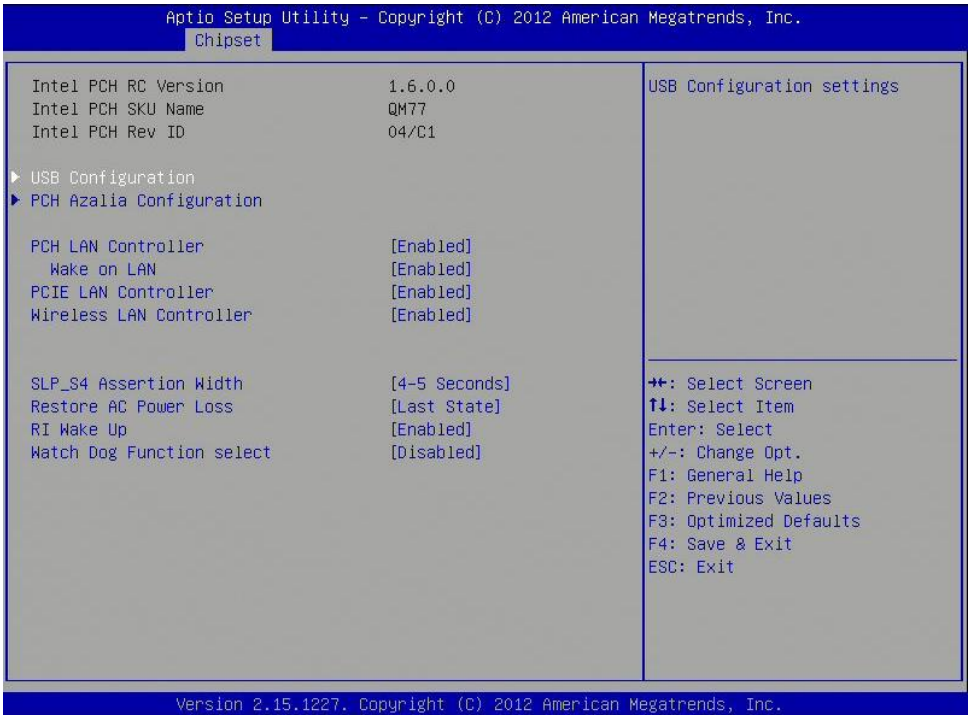
3.5 Chipset

This section gives you functions to configure the system based on the specific features of the chipset. The chipset manages bus speeds and access to system memory resources.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
PCH-IO Configuration
System Agent (SA) Configuration
PCH Parameters
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.

3.5.1 PCH-IO Configuration

This section allows you to configure the North Bridge Chipset.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Chipset
Intel PCH RC Version 1.6.0.0
Intel PCH SKU Name QM77
Intel PCH Rev ID 04/C1
USB Configuration
PCH Azalia Configuration
PCH LAN Controller [Enabled]
Wake on LAN [Enabled]
PCIE LAN Controller [Enabled]
Wireless LAN Controller [Enabled]
SLP_S4 Assertion Width [4-5 Seconds]
Restore AC Power Loss [Last State]
RI Wake Up [Enabled]
Watch Dog Function select [Disabled]
USB Configuration settings
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.

USB Configuration

USB configuration settings

PCH Azalia Configuration

PCH Azalia configuration settings

PCH LAN Controller

Enable or disable onboard NIC.

Wake on LAN

Enable or disable integrated LAN to wake the system. (The Wake On LAN cannot be disabled if ME is on at Sx state.)

PCIE LAN Controller

Enable or disable onboard PCIE LAN

Wireless LAN Controller

Enable or disable onboard MPCIE LAN-Wireless LAN.

SLP_S4 Assertion Width

Select a minimum assertion width of the SLP_S4# signal.

Restore AC Power Loss

Select AC power state when power is re-applied after a power failure.

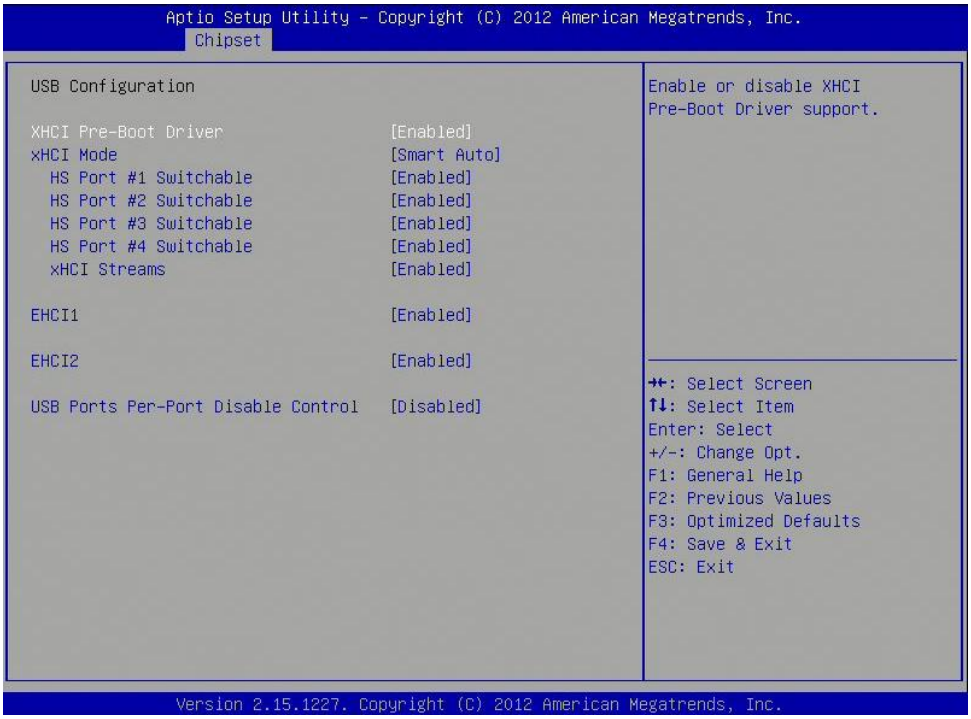
RI Wake Up

RI wake up function select.

Watch Dog Function select

Watch Dog function enabled or disabled.

3.5.1.1 USB Configuration


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Chipset
USB Configuration
XHCI Pre-Boot Driver [Enabled]
xHCI Mode [Smart Auto]
HS Port #1 Switchable [Enabled]
HS Port #2 Switchable [Enabled]
HS Port #3 Switchable [Enabled]
HS Port #4 Switchable [Enabled]
xHCI Streams [Enabled]
EHCI1 [Enabled]
EHCI2 [Enabled]
USB Ports Per-Port Disable Control [Disabled]
Enable or disable XHCI Pre-Boot Driver support.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.

XHCI Pre-Boot Driver

Enable or disable XHCI Pre-Boot driver support.

XHCI Mode

Mode of operation of XHCI controller

HS Port #1/2/3/4 Switchable

Allows for HS port switching between xHCI and EHCI. If disabled, port is routed to EHCI. If HS port is routed to xHCI, the corresponding SS port is enabled.

xHCI Streams

Enable or disable xHCI Maximum Primary Stream Array Size.

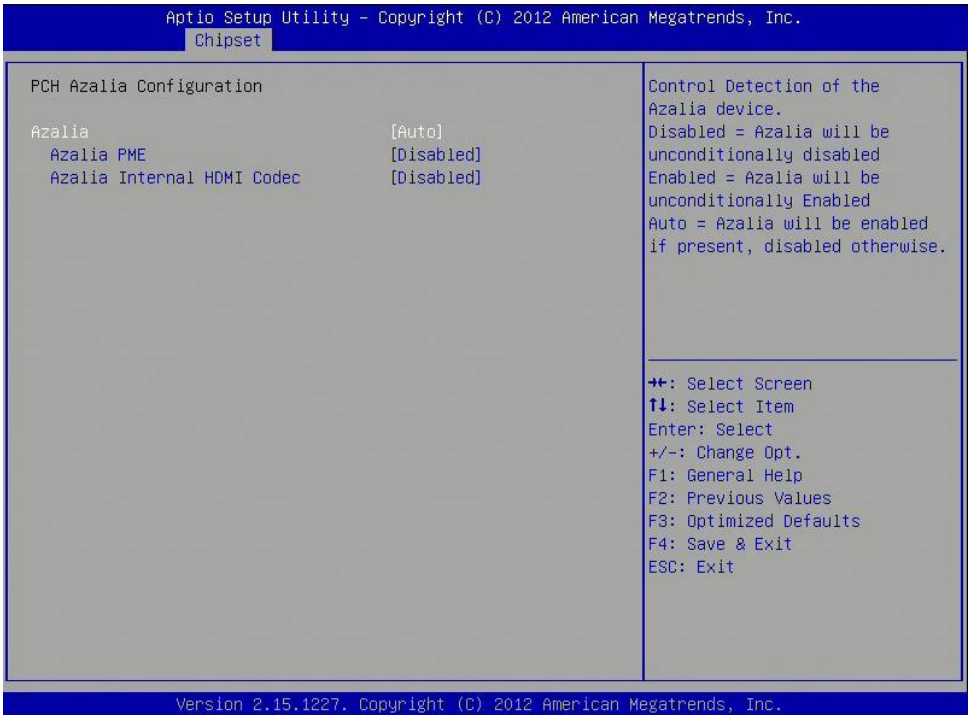
EHCI1/2

Control the USAB EHCI (USB 2.0) functions. One EHCI controller must always be enabled.

USB Ports Per-Port Disable Control

Control each of the USB ports (0~13) disabling.

3.5.1.2 PCH Azalia Configuration


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Chipset
PCH Azalia Configuration
Azalia [Auto]
Azalia PME [Disabled]
Azalia Internal HDMI Codec [Disabled]
Control Detection of the Azalia device.
Disabled = Azalia will be unconditionally disabled
Enabled = Azalia will be unconditionally Enabled
Auto = Azalia will be enabled if present, disabled otherwise.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
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Azalia

Control Detection of the Azalia device.

Disabled=Azalia will unconditionally disabled.

Enabled=Azalia will be unconditionally enabled.

Auto=Azalia will enabled if present, disabled otherwise.

Azalia PME

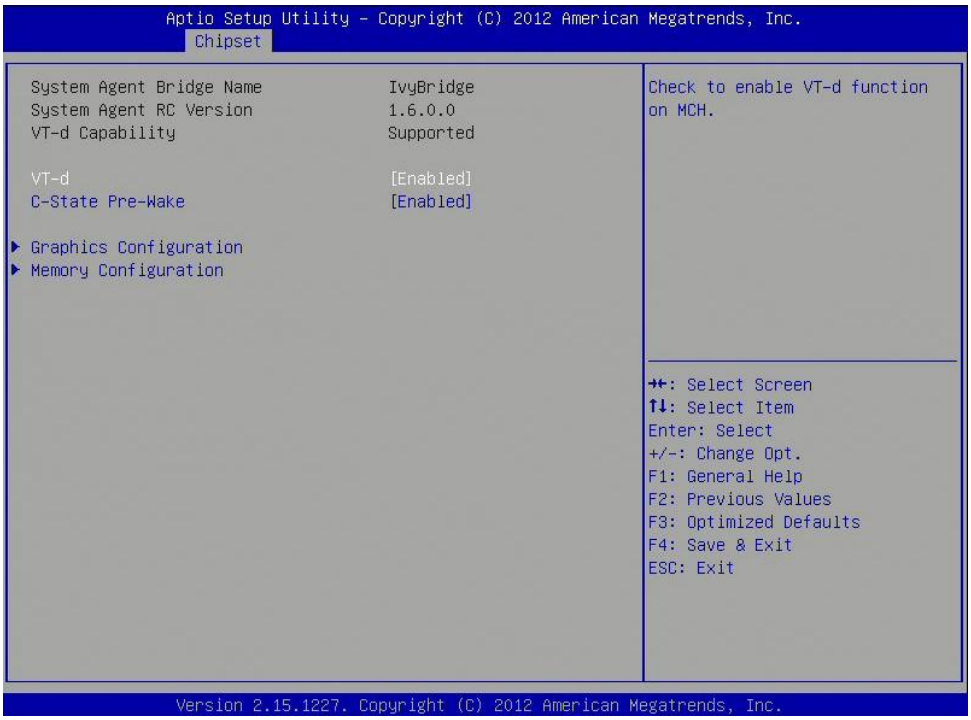
Enable or disable Power Management capability of audio controller.

Azalia Internal HDMI codec

Enable or disable internal HDMI codec for Azalia.

3.5.2 System Agent (SA) Configuration

This section is used to configure the System Agent (SA) configuration.



VT-d

Check to enable VT-d function on MCH.

Enable NB CRID

Enable or disable NB CRID WorkAround.

C-State Pre-Wake

Controls C-State Pre-Wake feature for ARAT, in SSKPD[57].

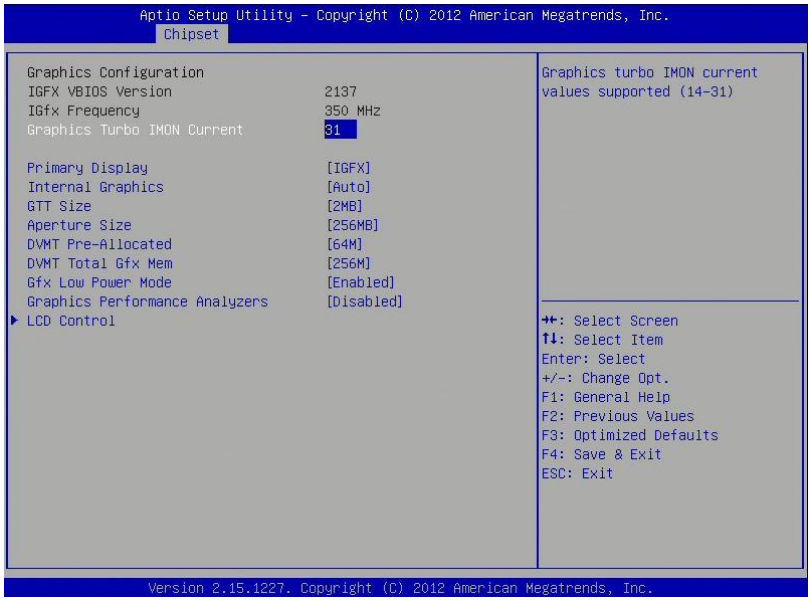
Graphics Configuration

Configure graphics settings

Memory Configuration

Memory configuration parameters

3.5.2.1 Graphics Configuration



Primary Display

Select which of IGFX/PEG/PCI graphics device should be primary display or select SG for switchable Gfx.

Internal Graphics

Keep IGD enabled based on the setup options.

DVMT Pre-Allocated

Select DVMT 5.0 Pre-Allocated (Fixed) graphics memory size used by the internal graphics device.

DVMT Total Gfx Mem

Select DVMT 5.0 total graphics memory size used by the internal graphics device.

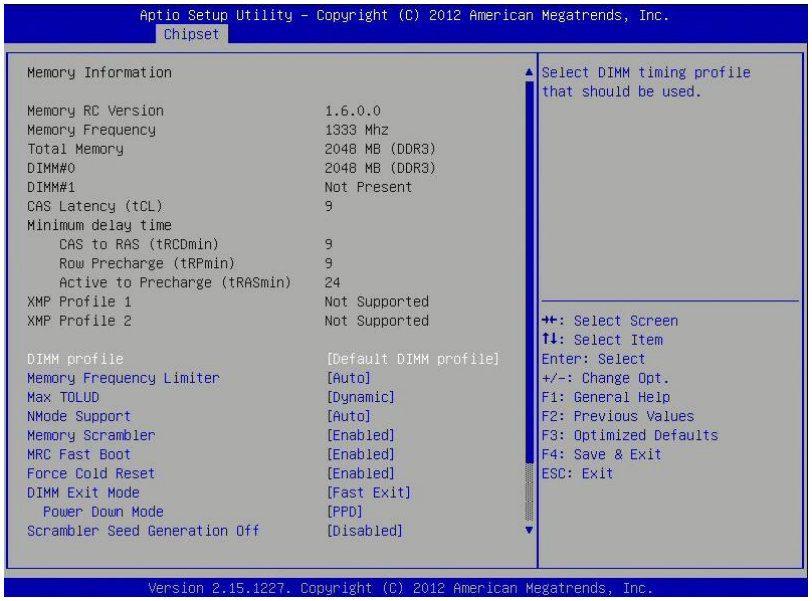
Gfx Low Power Mode

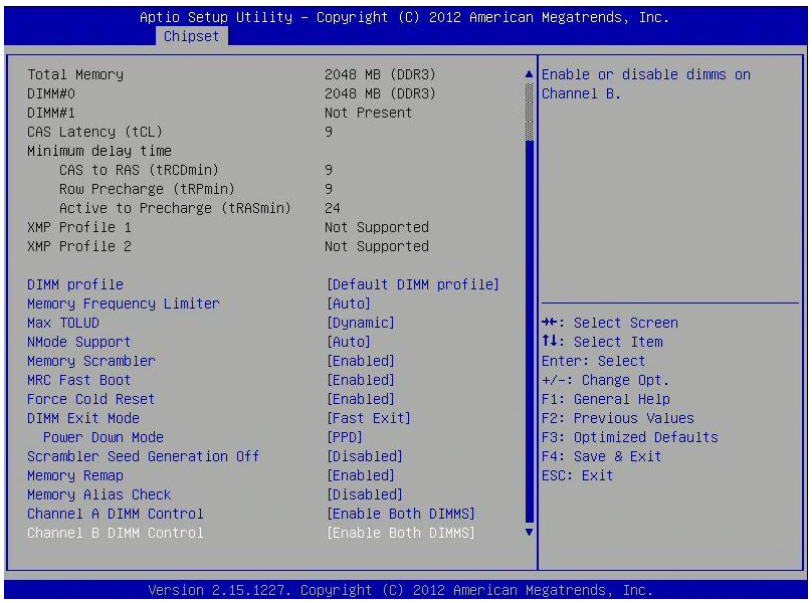
This option is applicable for SFF only.

Graphics Performance Analyzers

Enable or disable Intel graphics performance analyzers counters.

3.5.2.2 Memory Configuration


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Chipset
Memory Information
Memory RC Version 1.6.0.0
Memory Frequency 1333 Mhz
Total Memory 2048 MB (DDR3)
DIMM#0 2048 MB (DDR3)
DIMM#1 Not Present
CAS Latency (tCL) 9
Minimum delay time
CAS to RAS (tRCDmin) 9
Row Precharge (tRPmin) 9
Active to Precharge (tRASmin) 24
XMP Profile 1 Not Supported
XMP Profile 2 Not Supported
DIMM profile [Default DIMM profile]
Memory Frequency Limiter [Auto]
Max TOLUD [Dynamic]
NMode Support [Auto]
Memory Scrambler [Enabled]
MRC Fast Boot [Enabled]
Force Cold Reset [Enabled]
DIMM Exit Mode [Fast Exit]
Power Down Mode [PPD]
Scrambler Seed Generation Off [Disabled]
Select DIMM timing profile that should be used.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.15.1227. Copyright (C) 2012 American Megatrends, Inc.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Chipset
Total Memory 2048 MB (DDR3)
DIMM#0 2048 MB (DDR3)
DIMM#1 Not Present
CAS Latency (tCL) 9
Minimum delay time
CAS to RAS (tRCDmin) 9
Row Precharge (tRPmin) 9
Active to Precharge (tRASmin) 24
XMP Profile 1 Not Supported
XMP Profile 2 Not Supported
DIMM profile [Default DIMM profile]
Memory Frequency Limiter [Auto]
Max TOLUD [Dynamic]
NMode Support [Auto]
Memory Scrambler [Enabled]
MRC Fast Boot [Enabled]
Force Cold Reset [Enabled]
DIMM Exit Mode [Fast Exit]
Power Down Mode [PPD]
Scrambler Seed Generation Off [Disabled]
Memory Remap [Enabled]
Memory Alias Check [Disabled]
Channel A DIMM Control [Enable Both DIMMS]
Channel B DIMM Control [Enable Both DIMMS]
Enable or disable dimms on Channel B.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
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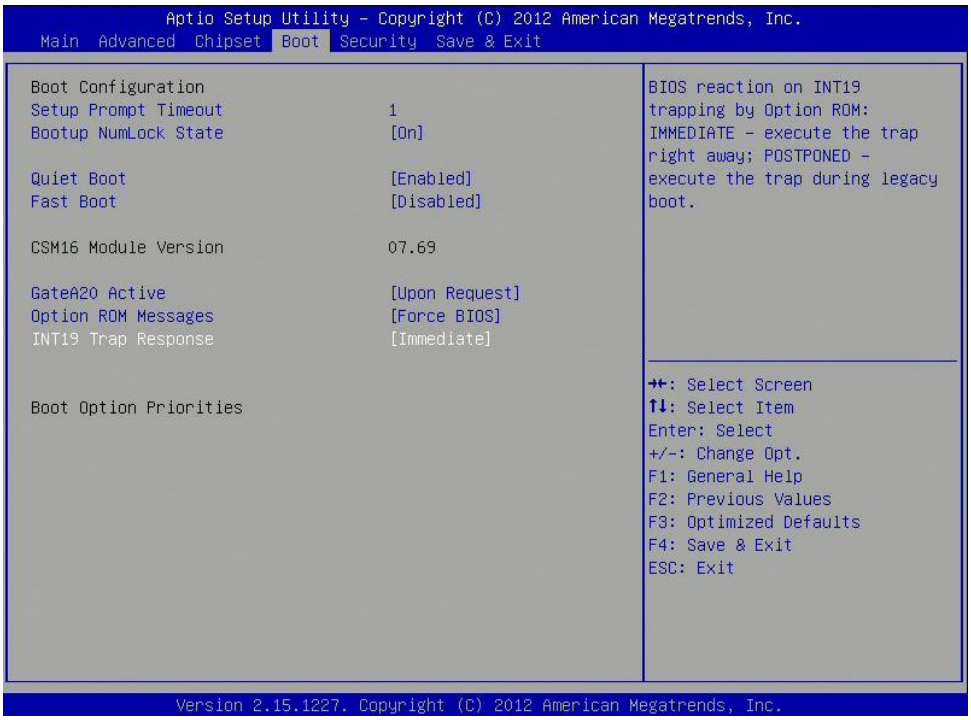
3.6 Boot Setting

This section is used to configure the boot features.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Boot Configuration
Setup Prompt Timeout 1
Bootup NumLock State [On]
Quiet Boot [Enabled]
Fast Boot [Disabled]
CSM16 Module Version 07.69
GateA20 Active [Upon Request]
Option ROM Messages [Force BIOS]
INT19 Trap Response [Immediate]
Boot Option Priorities
BIOS reaction on INT19 trapping by Option ROM: IMMEDIATE – execute the trap right away; POSTPONED – execute the trap during legacy boot.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
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Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

Bootup NumLock State

Select the keyboard NumLock state.

Quiet Boot

Enables or Disables Quiet Boot option.

Fast Boot

Enables or Disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.

GateA20 Active

UPON REQUEST – GA20 can be disabled using BIOS services.
ALWAYS – do not allow disabling GA20; this option is useful when any
RT code is executed above 1MB.

Option ROM Messages

Set display mode for Option ROM.

INT19 Trap Response

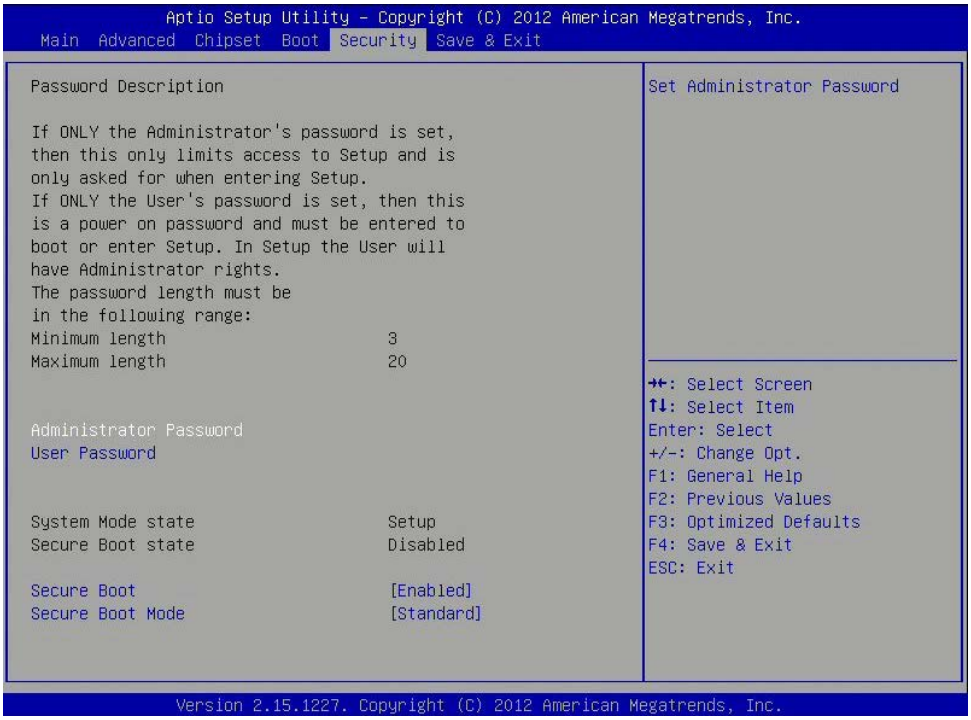
BIOS reaction on INT19 trapping by Option ROM: IMMEDIATE – execute the trap right away; POSTPONED – execute the trap during legacy boot.

Boot Option Priorities

Sets the system boot order.

3.7 Security

Use the Security Menu to establish system passwords


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Password Description
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights.
The password length must be in the following range:
Minimum length 3
Maximum length 20
Administrator Password
User Password
System Mode state Setup
Secure Boot state Disabled
Secure Boot [Enabled]
Secure Boot Mode [Standard]
Set Administrator Password
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
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Administrator Password

Set administrator password.

User Password

Set User Password.

Secure Boot

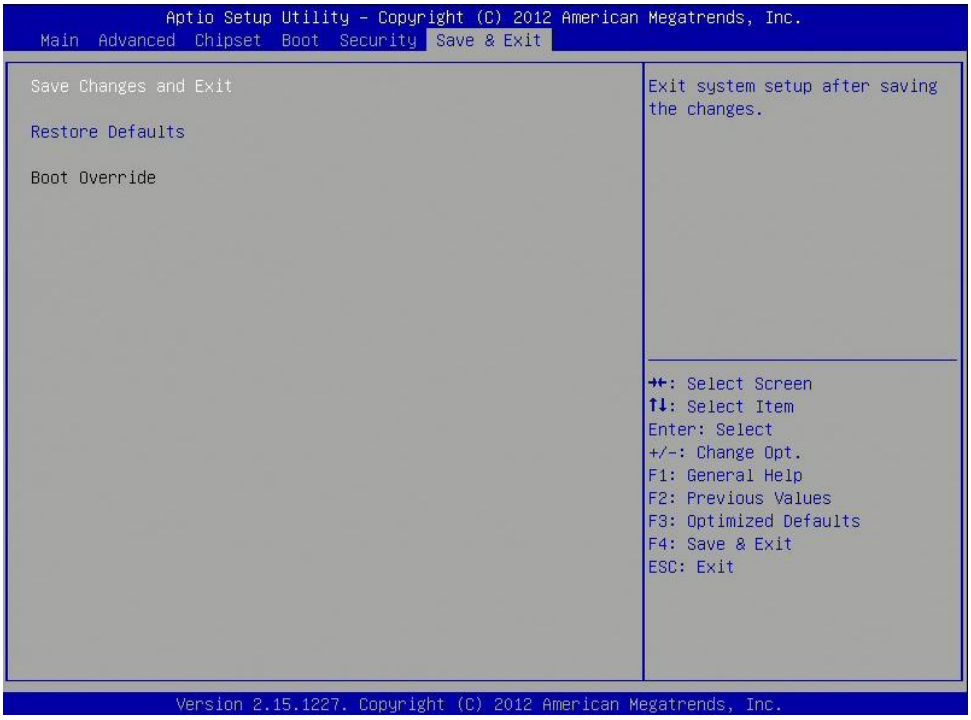
Secure boot flow control. Secure boot is possible only if system runs in user mode.

Secure Boot Mode

Secure boot mode selector. 'Standard' – fixed secure boot policy, 'custom' – changeable image execution policy and secure boot key databases.

3.8 Save and exit

This screen provides functions for handling changes made to the BIOS settings and the exiting of the Setup program.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Save Changes and Exit
Restore Defaults
Boot Override
Exit system setup after saving the changes.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
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Save Changes and Exit

Exit system setup after saving the changes.

Restore Defaults

Restore or Load Defaults values for all the setup options.